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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,781	12/07/2000	Jonathan Herman Fischer	FISCHER 35-47-14	9128

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EXAMINER
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BRINEY III, WALTER F

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/730,781

Applicant(s)

FISCHER ET AL.

Examiner

Walter F Briney III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01 November 2004 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-3, 5, 10-12, 14, 20, 23-25, and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Bingel et al. (US Patent 6,173,021).**

**Claim 1** is limited to a *DSL front end*. Bingel discloses a method and apparatus for reducing interference in a twisted wire pair transmission system. See Abstract. In overview, the system of Bingel, depicted in both figures 1 and 2, interfaces a customer premises (6) with a central office (4) by way of a twisted wire pair (5), i.e. *communication channel*. The customer premises includes a differential receiver (15),

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which is incorporated within a DSL modem. See column 3, lines 37-39. Bingel also discloses that DSL modems contain *hybrid* circuitry. See column 1, line 63 through column 2, line 5. Bingel also discloses an *interference canceller* (10) that generates an output resembling interference whose source is external to the telephone network. The canceller (10) uses a detector (9), such as a wideband antenna, to detect noises in a large frequency band (i.e. *AM*) that are directly coupled into the wire pair, and thus, before they reach the hybrid of the DSL modem. See column 3, lines 54-60. Upon detection and sampling/scaling, the cancellation signal produced by element (10) is combined with the received signal from the hybrid circuitry at adder (12). Therefore, Bingel anticipates all limitations of the claim.

**Claims 10, 20, and 32** are essentially the same as claim 1, and are rejected for the same reasons.

**Claim 2** is limited to *the DSL front end according to claim 1*, as covered by Bingel. As seen in figure 2, the datapath disclosed by Bingel is digital. The signal received from the detector (9) and the differential receiver (15) are digitized by respective ADC units (16) and (21). They are subsequently combined at *digital adder* (12). Therefore, Bingel anticipates all limitations of the claim.

**Claims 11 and 24** are essentially the same as claim 2, and are rejected for the same reasons.

**Claim 3** is limited to *the DSL front end according to claim 1*, as covered by Bingel. The system depicted in figures 1 and 2 of Bingel corresponds to an ADSL

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system as discussed in the background section. See column 1, lines 34-62. Therefore, Bingel anticipates all limitations of the claim.

**Claims 12 and 25** are essentially the same as claim 3, and are rejected for the same reasons.

**Claim 5** is limited to *the DSL front end according to claim 1*, as covered by Bingel. As already discussed in the rejection of claim 1, Bingel discloses a detector (9) for generating an AM interference signal. Therefore, Bingel anticipates all limitations of the claim.

**Claims 14 and 23** are essentially the same as claim 1, and are rejected for the same reasons.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 4, 6, 13, 15, 21, 22, and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bingel in view of Yeap et al. (US Patent 6,052,420).

**Claim 4** is limited to *the DSL front end according to claim 1*, as covered by Bingel. Bingel discloses that the signal processor (19) is preferably an adaptive system, and generates a cancellation signal in accordance with the amount of interference coupled onto the transmission loop (5). See column 2, lines 43-47. While not explicitly

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disclosed, it is quite clear that the differential receiver's hybrid will couple differential interference as DSL hybrids inherently reject common mode signals. However, it is not clear how Bingel intended to couple the interfering signal for processing. In fact, Bingel does not provide any enabling disclosure to support the selection or construction of the detector nor the sampling/scaling device. Therefore, Bingel anticipates all limitations of the claim with the exception *determining an amount of differential mode coupling...with respect to an amount of common mode coupling*.

Yeap teaches an adaptive multiple sub-band common-mode RFI suppression system. See Abstract. In overview, Yeap discloses in figure 2, teaches the details of a noise estimator unit that corresponds with the sampling and scaling device of Bingel. The inputs include a common-mode interference input and a differential feedback from summer (19) that corresponds with adder 12 of Bingel. It follows that it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the sampling/scaling device using the processor as taught by Yeap and to configure the antenna of Bingel as a common mode coupling element since Bingel does not provide any limitation towards how the processor and antenna should be constructed, and thus, inherently requiring one of ordinary skill to find an enabling disclosure.

**Claims 13, 21, 22, and 33** are essentially the same as claim 4, and are rejected for the same reasons.

**Claim 6** is limited to *the DSL front end according to claim 1*, as covered by Bingel. Referring to the rejection of claim 4, it would have been obvious to combine the teachings of Bingel and Yeap because even though Bingel discloses using an adaptive

processor for interference cancellation, it is the teachings of Yeap that enable one of ordinary skill in the art to practice the invention of Bingel. Figure 2 of Yeap depicts the broad overview of the noise cancellation system. It includes a noise detection and control unit (24). Figure 4 depicts the details of said detection and control unit.

Specifically, noise is detected within the common mode signal by bandpass filtering the signal (29) and demodulating it (36). The demodulating process includes detecting the carrier frequency of the most abundant common mode noise source. See column 8, lines 8-22. It is clear to those skilled in the art that the loop formed by the demodulating circuit (36), the VCO (34) and the microcontroller (30) is that of a *phase locked loop*.

Therefore, Bingel in view of Yeap makes obvious all limitations of the claim.

**Claim 15** is essentially the same as claim 6, and is rejected for the same reasons.

3. **Claims 7-9, 16-18, 26-29, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeap in view of Shenoi (US Patent 5,764,704).**

**Claim 7** is limited to *the DSL front end according to claim 1*, as covered by Bingel in view of Yeap. Yeap discloses a bandpass filter used in processing the common mode interference signal, but does not disclose the detailed structure. Therefore, Bingel in view of Yeap makes obvious all limitations of the claim with the exception *wherein said AM interference canceller comprises: a Hilbert bandpass filter*.

Shenoi teaches using a Hilbert bandpass filter for performing narrowband filtering of periodic carrier type signals (i.e. AM radio waves) (column 2, lines 18-28). It would have been obvious to one of ordinary skill in the art at the time of the invention to

implement the Hilbert bandpass filter of Shenoi for the purpose of providing the narrowband bandpass filters of Yeap used for generating an interference cancellation signal.

**Claims 16, 26, and 34** are essentially the same as claim 7, and are rejected for the same reasons.

**Claim 8** is limited to *the DSL front end according to claim 7*, as covered by Bingel in view of Yeap and further in view of Shenoi, *wherein said AM interference canceller further comprises: an FFT analyzer to determine a frequency of a most significant AM radio signal*; Yeap discloses using an FFT analyzer to determine the frequency of a most significant common mode interference (i.e. AM radio signal) (column 6, lines 31-36 and column 10, lines 5-8). Therefore, Bingel in view of Yeap and further in view of Shenoi makes obvious all limitations of the claim.

**Claims 17 and 29** are essentially the same as claim 8, and are rejected for the same reasons.

**Claim 9** is limited to *the DSL front end according to claim 7*, as covered by Bingel in view of Yeap and further in view of Shenoi. Yeap discloses an adaptive algorithm used to update the filter coefficients of the bandpass filters. Therefore, Bingel in view of Yeap and further in view of Shenoi makes obvious all limitations of the claim with the exception *wherein said AM interference canceller further comprises: an LMS module to adjust a frequency of I and Q channels of said Hilbert bandpass filter*.

The examiner takes Official Notice of the fact that the LMS algorithm was well known at the time of the invention for generating adaptive coefficients for a noise



cancellation system. It would have been obvious to one of ordinary skill in the art at the time of invention to implement an LMS module for the purpose of updating the Hilbert bandpass filters of Yeap in view of Shenoi.

**Claims 18 and 27** are essentially the same as claim 9, and are rejected for the same reasons.

**Claim 28** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 27*, as covered by Bingel in view of Yeap and further in view of Shenoi, *further comprising: providing a coarse adjustment of said Hilbert bandpass filter with a determined carrier frequency*; Yeap discloses adjusting (i.e. coarse adjustment) the bandpass filters based on a spectral analysis (i.e. that generate a determined carrier frequency) (column 6, lines 31-36). Therefore, Bingel in view of Yeap and further in view of Shenoi makes obvious all limitations of the claim.

**Claim 29** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 28*, as covered by Bingel in view of Yeap and further in view of Shenoi, *further comprising: determining said determined carrier frequency using an FFT analyzer*; Yeap discloses determining the noisiest common mode frequency (i.e. determined carrier frequency) using an FFT analyzer (column 9, line 60-column 10, line 8). Therefore, Bingel in view of Yeap and further in view of Shenoi makes obvious all limitations of the claim.

4. **Claims 19, 30, and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bingel in view of Yeap and further in view of Srinivasagopalan et al. (US Patent 4,689,804).

**Claim 19** is limited to *the digital subscriber line front end according to claim 10*, as covered by Bingel in view of Yeap. While Yeap teaches using a PLL for carrier frequency recovery, the microprocessors method is not explicitly disclosed. Therefore, Bingel in view of Yeap makes obvious all limitations of the claim with the exception of making a *sine gain adjustment to generate a sine signal relating to said most significant frequency*.

Srinivasagopalan teaches a method and apparatus for reduction of sinusoidal phase jitter in a high-speed data modem. The device includes frequency generation units (26) and (34), which are used to index the SIN/COS lookup table (20), which ultimately provides an output to demodulator (18). With respect to Yeap, the demodulator corresponds to the multiplier (36), the SIN/COS lookup table corresponds to the VCO (34), and the frequency/angle calculation units correspond to the microcontroller (30). Srinivasagopalan teaches sine wave generation (column 6, lines 63-65) and gain adjustment (column 2, lines 42-46 and 60-68). *A cosine gain adjustment to generate a cosine signal relating to said most significant frequency*; Srinivasagopalan teaches cosine wave generation (column 6, lines 63-65) and gain adjustment (column 2, lines 42-46 and 60-68) that is related to the frequency of the phase locked loop (i.e. relating to the most significant frequency). It would have been obvious to implement the VCO and microcontroller in the way taught by Srinivasagopalan for the purpose of enabling the implementation and practice of Bingel in view of Yeap.

**Claim 30** is essentially the same as claim 19, and is rejected for the same reasons.

**Claim 31** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 30*, as covered by Bingel in view of Yeap and further in view of Srinivasagopalan, *further comprising: adjusting said gain adjustments based on an LMS algorithm*. The examiner takes Official Notice of the fact that the LMS algorithm is used to perform adaptive updating of a noise cancellation system. It would have been obvious to one of ordinary skill in the art at the time of invention to implement an LMS module for the purpose of adaptively updating the gain of the cosine and sine waves of Bingel in view of Yeap and in further view of Srinivasagopalan.

### ***Response to Arguments***

Applicant's arguments, filed 03 August 2004, with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F Briney III whose telephone number is 703-305-0347. The examiner can normally be reached on M-F 8am - 4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB  
2/2/05

  
**SINH TRAN**  
SUPERVISOR PATENT EXAMINER